Abstract Of The Disclosure

A graphics system including a custom graphics and audio processor produces exciting 2D and 3D graphics and surround sound. The system includes a graphics and audio processor including a 3D graphics pipeline and an audio digital signal processor. Emboss style effects are created using fully pipelined hardware including two distinct dot-product computation units that perform a scaled model view matrix multiply without requiring the Normal input vector and which also compute dot-products between the Binormal and Tangent vectors and a light direction vector in parallel. The resulting texture coordinate displacements are provided to texture mapping hardware that performs a texture mapping operation providing texture combining in one pass. The disclosed pipelined arrangement efficiently provides interesting embossed style image effects such as raised and lowered patterns on surfaces.